

WILDLIFE HARVEST AND POPULATION STATUS REPORT

SMALL GAME HARVEST SURVEY -- 2001-2002

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INTRODUCTION

The Small Game Harvest Survey has been sent annually, since 1967, to samples of permit holders who can hunt small game in Missouri. This mail questionnaire consists of asking permit holders if they hunted small game, how many of each species were harvested, where they hunted most, and how many days they hunted. This survey is conducted after the end of the small game hunting season (usually in March).

Beginning with the 1996-97 hunting season, the Small Game Harvest Survey has used the Point of Sale (POS) database of permit buyers to gain greater efficiency through sampling procedures. Stratification of the sampling frame has been used to reduce the variation within the estimates, and non-residents have been included in the survey since 1996. Therefore, the results from the 2001-2002 Small Game Harvest Survey are only compared to the 5 previous survey efforts.

Estimates of hunter numbers, harvest and effort (days afield) were calculated for 18 small game species from the results of the 2001-2002 Small Game Harvest Survey. Questionnaires were mailed to 12,500 small game permit purchasers who held a 2001 or a 2002:

- Resident Small Game Hunting Permit
- Non-Resident Small Game Hunting Permit
- Resident Combination Hunting and Fishing Permit
- Daily Small Game Hunting Permit
- Lifetime Hunting Partner Permit

(Recall that 2002 permits sold from December 1, 2001 through February 28, 2002 were valid during the 2001-2002 small game season.) From the 11,445 questionnaires successfully delivered, a total of 5,888 responses were received, representing a 51.45% response rate of the questionnaires delivered. Of those, 5,530 were usable for this analysis. This usable response represents a 48.32% response rate of the questionnaires delivered.

HUNTER NUMBERS

Total 2001 permit sales for small game hunters, both resident and non-resident, declined slightly (-3.3%; Table 1). Of those 2001 and 2002 permit holders included in our sample, an estimated 68.6% actually hunted small game, up slightly from the 66.3% estimated in the 2000-2001 survey (Table 1). Even though the proportions were about the same, the number of estimated small game hunters increased about 2.7% in 2001-2002 compared to the 2000-2001 estimate. However, estimated hunter numbers in 2001-2002 showed potential decreases for 11 of the 18 species (Table 2). Two decreases in hunter numbers were statistically different, as shown by non-overlapping 95% confidence intervals with 2001-2002 and 2000-2001 results. The estimated total number of rabbit hunters was 74,745, which was a decrease of 8,256 hunters from last year. The estimated total number of quail hunters was 41,464, which was a decrease of 5,916 hunters from last year. One species showed a significant increase in hunter numbers. The estimated total number of duck hunters was 37,760, which was an increase of 4,605 hunters from last year. Overall, hunter numbers appeared to be relatively stable (Table 2).

HARVEST AND EFFORT

As would be expected, estimated total days afield tended to follow the hunter number trends. For the commonly hunted species, the total days spent afield by 2001-2002 hunters continued to show a decline when compared to previous year's estimates. The number of days afield spent by pheasant hunters statistically significantly decreased, as demonstrated by non-overlapping confidence interval between 2001-2002 and 2000-2001 estimates. This was the only significant trend when comparing 2001-2002 days-afield with those from 2000-2001 (Table 2). However, for other commonly hunted species, such as rabbits and quail, estimates of number of days-afield spent by hunters showed notable non-significant declines from the previous year.

Total harvest estimates for 2001-2002 showed a significant decline from 2000-2001 for three species of the 18 surveyed (Table 2). These statistical declines were in the rabbit, quail and pheasant harvest estimates. Squirrel and snow goose showed a significant increase from the 2000-2001 harvest estimates. All other species had overlapping 95% confidence intervals with the 2000-2001 survey. However, species such as raccoon and bobcat showed an increase in harvest estimates from the previous year. Crows showed a notable decline from the previous year. For the other 9 species, their harvest estimates were either relatively stable or were not statistically different from the previous year (Table 2).

Hunter success, as estimated by bag per day, neither increased nor decreased significantly for all species during the 2001-2002 season when compared to the 2000-2001 results (Table 2). However, the estimated bag per day for raccoon, pheasant, crow, and snow goose showed non-significant change from the previous year. Raccoon and snow goose hunters saw an increase in their success, while pheasant and crow hunters had a decrease in their bag per day estimates (Table 2).

DISCUSSION

Even though the number of small game permits decreased in 2001, the proportion of those used by hunters in 2001-2002 increased slightly when compared to the estimates for the 2000-2001 season. While combination hunting and fishing and lifetime hunting permit sales declined, resident small game hunting and non-resident small game hunting/daily small game hunting permit sales increased over the previous year.

The decrease in permit sales did not substantially impact the number of small game hunters in 2001. The number of permit holders that used their permits increased slightly during the 2001-2002 season. The permit sales decrease is probably due, in part, to year 2002 hunting permits being available on December 1, 2001, and valid for use during the latter part of the 2001-2002 small game season. These permit sales are not reflected in the 2001 permit sales figures. Over 17,500 individuals appear to have taken advantage of this overlapping permit year situation and only purchased a 2002 small game permit. This number increased notably when compared to the 2000-2001 season, when just over 9,100 individuals purchased only a 2001 small game permit.

The number of quail hunters and quail harvested showed a significant decrease in 2001-2002 when compared to the previous season. The same was true of rabbit hunters and rabbits harvested. There was a decrease in the number of pheasant hunters and a significant decrease in the number of days afield in 2001-2002. This resulted in a significant decrease in the number of pheasant harvested. In contrast, the number of squirrel and snow geese harvested by hunters in 2001-2002 significantly increased when compared to the previous year. There was a significant increase in the number of duck hunters when compared to the previous year. Overall, the other species had estimates that were relatively stable when statistically compared to the previous year.

TABLE 1. Permit sales and estimated number of small game hunters by permit type from the 2001-2002 Small Game Harvest Survey. Permit sales, given only for comparison purposes, are taken from the *Annual Hunting and Fishing Permit Distribution and Sales Summary*. Estimated number of total hunters as well as hunter numbers for each permit type were generated independently from the permit sales figures. As a result, numbers do not add exactly.

	Combination Hunting and Fishing	Change from 2000	Resident Small Game Hunting	Change from 2000	Non-Res SG Hunt/Daily SG Hunt	Change from 2000	Lifetime Hunting	Change from 2000	Total	Change from 2000
2001 Permit Sales	161,335	-5.9%	56,560	2.8%	13,111	6.7%	18	-51.4%	231,024	-3.3%
Estimated Hunters^a	107,656	-0.5%	48,292	4.0%	10,967	17.6%	133	-5.7%	168,538	2.7%
Percent Hunters^b	64.2%	3.0%	75.9%	-1.5%	93.4%	4.2%	65.0%	-15.6	68.6%	2.3%

^a 17,586 early 2002 small game permit purchasers were included in our sampling frame because they did not hold a 2001 permit. The estimated number of hunters is based on the number of usable addresses available at the time of the survey. Therefore, these estimates underestimate the actual number of small game hunters holding permits.

^b The percent of hunters are an unbiased estimate of active hunters permitted to hunt small game in Missouri.

TABLE 2. Statewide summary for the Small Game Harvest Survey, 2001-2002, including resident and non-resident hunters. Non-overlap of 95% confidence intervals for current and previous year's estimates denoted by *. Undefined results denoted by "und".

Species	Total Hunters	% Of Hunting Pressure	Bag Per Day	Avg. Season Bag	Avg. Days Afield	Total Harvest	Total Days Afield
Rabbit	74,745	44.3	1.2	6.4	5.3	476,995	394,412
95% CI	71,565-77,799	42.7-45.8	1.1-1.3	5.9-6.8	4.9-5.7	437,006-515,856	363,098-429,235
% Change from 2000-2001	*-9.9	-8.9	-6.2	-7.9	-2.0	*-17.1	-11.8
% Change from 5-year mean	-15.4	-9.6	-3.2	-9.7	-6.1	-23.6	-20.8
Squirrel	91,621	54.3	1.7	12.9	7.7	1,180,329	701,487
95% CI	88,520-95,054	52.8-55.8	1.6-1.8	12.0-13.8	7.1-8.2	1,098,854-1,274,123	645,580-759,264
% Change from 2000-2001	1.5	2.7	5.7	18.5	12.0	*20.3	13.7
% Change from 5-year mean	-7.0	-0.4	8.7	11.9	3.2	3.6	-4.4
Quail	41,464	24.6	1.5	8.0	5.5	333,612	227,452
95% CI	38,984-43,844	23.2-25.9	1.3-1.6	7.1-9.0	5.1-5.9	289,763-380,048	205,309-248,765
% Change from 2000-2001	*-12.5	-11.5	-7.6	-11.6	-4.2	*-22.7	-16.2
% Change from 5-year mean	-27.1	-21.5	-14.0	-23.4	-9.6	-44.6	-34.5
Dove	40,879	24.2	4.3	17.7	4.1	722,276	167,703
95% CI	38,265-43,279	22.8-25.6	4.0-4.7	15.9-19.8	3.8-4.4	637,513-808,580	152,881-184,034
% Change from 2000-2001	-1.3	-0.2	5.6	7.2	1.5	5.8	0.3
% Change from 5-year mean	-5.8	0.6	5.0	2.2	-2.5	-3.8	-8.5
Pheasant	12,409	7.4	0.4	1.9	4.3	23,856	53,072
95% CI	11,053-13,875	6.5-8.2	0.4-0.5	1.6-2.2	3.8-4.8	19,430-28,658	44,348-62,808
% Change from 2000-2001	-19.7	-18.7	-18.2	-34.5	-19.4	*-47.3	*-35.2
% Change from 5-year mean	-33.1	-28.4	-17.0	-31.9	-20.1	-54.5	-46.4
Woodcock	2,003	1.2	0.9	2.1	2.4	4,148	4,696
95% CI	1,450-2,611	0.9-1.5	0.7-1.1	1.5-2.8	1.9-2.9	2,524-5,922	3,163-6,462
% Change from 2000-2001	0.9	2.6	43.5	2.5	-30.9	3.4	-30.6
% Change from 5-year mean	1.5	7.0	66.7	-6.2	-47.0	-3.3	-46.9

Species	Total Hunters	% Of Hunting Pressure	Bag Per Day	Avg. Season Bag	Avg. Days Afield	Total Harvest	Total Days Afield
Crow	14,038	8.3	1.7	7.8	4.5	109,020	62,892
95% CI	12,556-15,519	7.5-9.2	1.4-2.1	6.6-9.2	3.8-5.2	88,923-132,155	51,979-74,977
% Change from 2000-2001	5.0	6.3	-28.7	-38.5	-13.0	-35.5	-8.6
% Change from 5-year mean	20.6	28.7	-20.7	-33.7	-16.3	-20.3	0.7
Groundhog	4,001	2.4	0.7	3.1	4.5	12,525	17,875
95% CI	3,185-4,795	1.9-2.9	0.6-0.9	2.4-3.9	3.4-5.5	8,585-16,820	12,805-23,464
% Change from 2000-2001	-0.8	0.4	37.3	22.3	-12.4	21.1	-13.1
% Change from 5-year mean	-2.3	3.4	35.7	17.9	-21.8	14.5	-22.1
Raccoon	12,699	7.5	1.1	13.4	12.0	170,757	152,451
95% CI	11,323-14,142	6.7-8.4	1.0-1.3	11.0-16.2	10.3-13.6	135,302-212,040	126,560-180,573
% Change from 2000-2001	8.9	10.1	31.8	41.0	6.6	53.5	16.1
% Change from 5-year mean	-14.9	-9.0	-2.9	-2.9	0.7	-18.9	-14.9
Gray Fox	1,177	0.7	0.1	1.0	12.2	1,179	14,416
95% CI	726-1,650	0.4-1.0	0.03-0.2	0.4-1.7	7.0-17.6	393-2,148	6,561-23,445
% Change from 2000-2001	-25.3	-23.9	33.3	42.9	-7.4	7.7	-30.6
% Change from 5-year mean	-21.1	-17.1	-39.4	-34.6	-0.6	-49.9	-21.4
Red Fox	1,972	1.2	0.1	0.7	9.9	1,458	19,551
95% CI	1,411-2,584	0.8-1.5	0.04-0.1	0.4-1.1	5.9-14.4	728-2,341	10,455-30,168
% Change from 2000-2001	11.0	12.5	166.7	80.5	-20.4	99.4	-11.6
% Change from 5-year mean	1.6	7.5	-24.5	-32.4	-4.8	-33.6	-2.8
Coyote	22,117	13.1	0.3	2.1	8.2	46,899	180,956
95% CI	20,304-23,959	12.1-14.2	0.2-0.3	1.8-2.5	7.1-9.5	39,151-55,587	154,267-216,102
Change from 2000-2001	3.4	4.6	0.0	-5.4	-6.8	-2.2	-3.7
Change from 5-year mean	0.7	7.5	-11.6	-23.1	-13.4	-22.5	-13.0
Bobcat	2,548	1.5	0.1	0.8	8.8	1,969	22,409
95% CI	1,881-3,234	1.1-1.9	0.05-0.1	0.5-1.2	6.0-12.0	1,067-3,081	13,509-32,458
% Change from 2000-2001	-3.0	-2.0	50.0	63.8	13.4	59.4	9.9

Species	Total Hunters	% Of Hunting Pressure	Bag Per Day	Avg. Season Bag	Avg. Days Afield	Total Harvest	Total Days Afield
% Change from 5-year mean	27.5	33.9	0.0	1.6	13.3	36.1	43.9
Opossum	3,470	2.1	0.6	4.2	7.6	14,663	26,356
95% CI	2,750-4,292	1.6-2.5	0.4-0.7	3.1-5.5	5.3-10.3	9,985-20,931	17,215-37,344
% Change from 2000-2001	-1.4	0.0	9.8	-2.3	-11.2	-3.9	-12.6
% Change from 5-year mean	-24.8	-19.3	-23.1	-37.6	-18.8	-54.1	-39.2
Ruffed Grouse	238	0.1	0.05	0.1	2.1	23	493
95% CI	77-451	0.05-0.3	0-0.3	0-0.4	1.4-2.6	0-89	116-971
% Change from 2000-2001	-2.5	0.0	Und	Und	47.5	Und	43.7
% Change from 5-year mean	-32.7	-25.5	-54.5	-76.4	-32.8	-87.1	-52.5
Ducks	37,760	22.4	1.5	12.6	8.4	476,450	317,749
95% CI	35,495-40,234	21.1-23.7	1.4-1.6	11.6-13.7	7.8-9.0	427,350-525,516	289,919-349,820
% Change from 2000-2001	*13.9	15.2	-2.6	-4.5	-2.0	8.7	11.7
% Change from 5-year mean	19.9	27.8	3.2	-0.7	-4.1	18.4	14.5
Canada Geese	16,999	10.1	0.5	3.2	6.6	54,112	111,665
95% CI	15,429-18,697	9.2-11.1	0.4-0.6	2.7-3.7	5.9-7.4	44,342-65,155	95,211-128,343
% Change from 2000-2001	-3.9	-2.8	-23.4	-17.4	8.8	-20.6	4.4
% Change from 5-year mean	1.2	8.1	-3.2	-3.6	-4.3	-4.6	-3.0
Snow Geese	9,487	5.6	2.0	11.8	6.0	112,324	56,807
95% CI	8,220-10,896	4.9-6.4	1.4-2.6	8.1-15.7	5.0-7.0	76,252-155,092	44,582-70,236
% Change from 2000-2001	21.7	23.0	61.0	68.5	4.7	*105.3	27.5
% Change from 5-year mean	10.5	18.2	81.6	55.1	-13.1	68.0	-4.9